

REMARKS

Claim Rejections - 35 USC §101

1. The examining attorney has rejected claims 1-19 under 35 USC §101 as non-statutory subject matter, as claims 1-19, in the words of the examining attorney, "do not require the manipulation of an apparatus, do not result in a concrete and tangible result and fail to transform the subject matter to a something different than existed before the steps were performed."

2. The applicant has amended his claims, as set forth above, to describe (1) apparatus (manufacture), or (2) steps which transform the subject matter to something of a different than existed before the steps were performed utilizing the apparatus described. More particularly, but only by way of example, new claim 20 describes "cards," and sets of cards, bearing unique "directions." By way of further example, new claim 22 describes "a game playing surface marked with a plurality of indicia, and a plurality of markers for positioning on the plurality of indicia..." Each of these claims, and all of applicant's revised claims except new claims 34-39 and new claim 43, contain similar apparatus.

3. As to the processes of new claims 34-39 and 43, "directions" are "selected" and "presented" for response by game players, whereupon the game players then act by "recalling" information of the specified type, and "responding" by communicating to another game player. The process of new claim 34, for example, is thereby used to produce tangible results (the responses), as the information called for by the directions is retrieved from the memory of game players, and then used to formulate such responses. The directions are in this process therefore transformed into answers. By way of further example, new claim 36 describes "placing a marker on or near a position..." This new claim therefore describes the additional step, adding to the process of transforming directions to responses, of translating responses into the further concrete, tangible result of marker movement on a game board.

1 4. Moreover, the apparatus now described in new claims 20-33 and 40-42 describe cards
2 which might be initially characterized by their "directions" as an "arrangement of printed
3 matter," however it should be noted that the applicant is not attempting to define the cards as
4 different by the difference in specific printed matter. So, for instance, while printed matter
5 appears on each card, that printed matter varies from one card to the next, and may be
6 supplemented by an infinite (literally) variety of other "directions," so long as such other
7 directions meet the requirements of inclusion in one of the decks of cards. And the
8 requirements for such inclusion are mutually exclusive. Therefore, the apparatus of these
9 claims, while bearing printed matter, is more reasonably characterized as separate decks of
10 cards, which decks stimulate retrieval of information from memory, and a response (or
11 "performance of a unique task"). The directions are designed to stimulate specific memory
12 systems, such that a responsive answer or performance by a game player predictably requires
13 retrieval of information of a specific kind (more on the scientific basis for this claim below).
14 Whether combined with additional apparatus such as "a game playing surface" or "markers"
15 (new claim 22) or standing alone, the sets (or decks) of cards having the necessary
16 characteristics (but not identified or distinguished by any specific "indicia") comprise
17 apparatus which is patentable.

18
19 5. Moreover, the grouping of directions, or grouping of cards in sets or decks of cards, in
20 applicant's invention also provides tangible structure which creates a manufacture, even
21 though the invention embodies a scientific principle (just as a bicycle embodies the scientific
22 principles of speed, acceleration, uniform and rotational momentum, and the like). With such
23 groupings, the new claims set forth above can be viewed as an attempt to gain the rights to
24 exclude the use of memory (the scientific principle), but only when such use is stimulated by
25 questions or directions, which questions or directions are grouped by the memory systems
26 from which answers responsive to the questions or directions predictably arise (the tangible
27 structure), and in some cases where the grouping of directions is a result of the sorting of cards
28 into the sets or decks of cards which correspond to such memory systems (the additional

1 tangible structure). The inventor puts this somewhat differently where, in the inventor's
2 memorandum dated November 9, 2005 on memory systems (attached to this response), he
3 says: "The instant claims seek to exclude based on the use of memory retrieval tasks which
4 stimulate and activate specific memory systems in the human brain over which the players
5 have control due to the construction and design of the tasks." With either statement of the use
6 of the invention, the inventor's directions and decks are tangible structure relating to the
7 identified memory systems employed in the inventor's game to accomplish results (responsive
8 activities) utilizing scientific principles.

9
10 6. After the amendments set forth above, the invention is also operative, and so has
11 utility. Some explanation is in order here, as the examining attorney appears to be under some
12 misapprehension about the current state of the science regarding memory. We therefore attach
13 to this response the inventor's memorandum dated November 9, 2005 on memory systems. In
14 this memorandum, the inventor cites authorities which have been studying memory as a matter
15 of human cognitive science, and he sets forth clearly how game of the present invention
16 engages recognized memory systems. He goes on to say that, contrary to the understanding of
17 the examining attorney and the references cited by the examining attorney, questions and
18 directions may be designed to predictably stimulate primarily a single memory system, and the
19 inventor has himself employed such questions and directions to do precisely this with groups
20 of seniors for two years. The "control over which systems of memory [players] resort to when
21 facing a question or problem" (as the examining attorney has posed the factor to review when
22 considering operability), is supplied by the structure of the game in the form of groupings of
23 directions, and groupings of cards in sets or decks of cards.

Claim Rejections - 35 U.S.C. §112

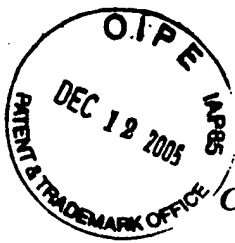
7. The applicant has with this amendment canceled claims 1-19, and presented new claims 20-43. The applicant believes all objections to the claims identified in the Office Action dated 06/02/2005 are now moot, and applicant therefore respectfully requests the examining attorney withdraw his rejections under 35 U.S.C. §112.

Claim Rejections - 35 USC §103

8. The examining attorney has also rejected claims 1-19 as being unpatentable over Henry 4,714,255 in view of Alexander 6,279,909. The examining attorney bases this rejection in part on the misunderstanding that a player inherently uses all of his memory systems, short-term, semantic and episodic memory systems, available to him based upon his individual ability in order to answer [questions]. However, as noted above in this response, and supported by substantial authority, one or more memory systems may be preferentially stimulated depending on the character of the question or direction presented. As noted by the inventor in his memorandum on memory attached hereto, and authorities cited therein, the response to such directions or questions will depend in large part on what is retrieved from the memory of a player, what is retrieved depends on the memory system stimulated, and the stimulation of memory systems may be substantially controlled by the character of the directions or questions. And, while factual trivial games (such as that found in Henry), and games which require a mix of tasks (such as that found in Alexander) each exist, the inventor knows of no games which involve retrieval of information from substantially one memory system at a time, which retrieval is a direct result of a deliberate choice of directions and questions designed to elicit responses which contain information from only that one memory system at a time. Alexander adds nothing to Henry to point the way to the instant invention for those skilled in the art, as the "mix of tasks, questions and actions" of the instant invention (if we assume for a moment this is a reasonable characterization for the tasks of the instant

1 invention), all depend exclusively on such retrieval of information from substantially one
2 memory system at a time. This is not merely a greater variety of questions or merely added
3 tasks as may be found in Alexander (and other patented games). With respect to the
4 applicant's use of the term "instructions" per se, the instructions to which the present
5 disclosure refers are the individual directions or questions of the game, generally found on
6 individual cards, and not the general instructions for play of the game. However, "directions"
7 is thought to be an acceptable word to describe such individual directions or questions, and the
8 word "directions" is now employed in all new claims (with abundant support in the
9 disclosure).

10
11 9. Further, the inventor appreciates that "a property or a scientific explanation of the prior
12 art's functioning does not negate the fact that the prior art inherently possessed the claimed
13 element; a failure to discuss the science behind the memory skills used in answering of prior
14 art game tasks should not make the instant invention patentable. However, it is not the use of
15 memory the inventor has herein disclosed and claimed. Rather, what is claimed herein is: (1)
16 the use of specifically designed directions or questions, (2) intentionally chosen and (3)
17 segregated to correspond to, and (4) stimulate recollection from, (5) specific memory systems,
18 (6) one question per card, (7) one memory system per question, with the result that (8)
19 memories characterized by such memory systems may be recalled, and (9) tasks performed or
20 questions answered (substantially) specific to such memory systems, (10) consistent with the
21 design of the directions or questions. This has not been disclosed in the prior art to the
22 inventor's knowledge, and not disclosed in the references cited by (or made of record and not
23 relied upon by) the examining attorney.



Conclusion

10. Reconsideration of the application as amended respectfully is requested. The applicant believes that the claims as amended statutory subject matter, and are neither anticipated by prior references, nor obvious to one of ordinary skill in the relevant art. For the foregoing reasons, it is submitted that the claims of the present application are in condition for allowance, and such action is requested.

Dated: December 2, 2005

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Th W. Cook".

Thomas W. Cook, Reg. No. 38,849
Attorney for Applicant
Telephone Number: 415-339-8550

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8(a)

I hereby certify that the attached **Response to Office Action, Unnumbered Paper dated June 2, 2005** is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

on December 2, 2005

A handwritten signature in cursive script, appearing to read "Th W. Cook".
Thomas Cook

To: Tom Cook
From: Bennett Johnston
RE: memory systems
Date: 11/09/05



- A. The patent examiner says: "Broadly here the instant claims can be viewed as an attempt to exclude based on the use of memory in a question and answer game."

It is far more accurate, and useful, to say that: The instant claims seek to exclude based on the use of memory retrieval tasks which stimulate and activate specific memory systems in the human brain over which the players have control due to the construction and design of the tasks.

- B. The examiner apparently is under the impression that "Persons do not have control over which systems of memory they resort to when facing a question or problem." He concludes that "To say that a particular question will only stimulate one, two or three or a combination of memory systems is not operative since such is dependent upon the person and their memory functions and not on the question."

What follows is a more detailed discussion of memory systems, memory retrieval (as opposed to encoding) which should clear up some confusion about this complex, but very interesting topic..

It has been firmly established that there are multiple neurocognitive memory systems in the brain, each of which accomplishes different types of memory, with different neural pathways and rules of operation in the brain. A key issue is then:

Do the episodic, semantic, and short-term memory systems work independently; and does the game solicit responses that can predictably stimulate regions of the brain which are unique to only one memory system for any given player?

Episodic and Semantic Memory

We are constantly making use of information acquired in the past. In order to write this sentence I must retrieve words and grammatical rules that I learned long ago, yet I do not have a subjective experience of "remembering". This is **semantic memory**—*a subjective experience of remembering is never required to retrieve this information*. Every time you start your car and begin driving you are calling on knowledge you acquired years earlier, but *you do not feel as though you are revisiting the past when you call on this knowledge*. The semantic memory system contains conceptual and factual knowledge; and uses

a unique collection of neural pathways and collection of neurological synapses to accomplish it tasks.

But, as Daniel Schacter, Professor and Chairman of the Department of Psychology at Harvard University notes, in regards to the episodic memory system, "There is something special about the subjective experience of explicitly remembering past incidents that separates it from other uses of memory." When calling on the **episodic memory** system, *"...the information required must be recollected in the context of a particular time and place with some reference to oneself as a participant in the episode."* Dr. Endel Tulving, who first identified the episodic memory system in 1972 (and has continued research in this area for over thirty years) stresses that in order to activate the episodic memory system "mental time travel" and "reliving of something that happened in the past" is required. Schacter notes that "as rememberers we can free ourselves from the immediate constraints of time and space, reexperiencing the past..." He further notes that this conscious act of calling on episodic memory is accompanied by *the conviction that this episode is part of your personal history.*

Tulving, Schacter, et.al. have clearly established that: "whether or not you see yourself as a participant in a remembered event is to a large extent constructed at the time of recall. ***The way you remember an event depends on your purpose and goals at the time you attempt to recall it.***" (my emphasis)

While it is true that there is a certain degree of established inter-relationship between the episodic and semantic memory systems (both for instance require the use of language and numbers), the examiner unfortunately has cited incomplete descriptions of the inter-relationship which, as provided, are unintentionally misleading, as they are focused overwhelmingly on memory encoding and storage, not retrieval. (It should probably be noted that neither source was from neuroscientists, but instead the first was from a research assistant in the Computational Aerodynamics Lab at the Georgia Institute of Technology, Harish Kotbagi, who was attempting to mimic memory systems in the brain for insights in how to better manipulate computational data—an exciting and valid field of endeavor indeed, but one that is able to make only very limited use of episodic memory systems: basically they are only interested in episodic memory to the degree that it is involved in the source formation (encoding) of semantic memory data—which once it is rendered "semantic" can be manipulated computationally. This is particularly evident in the chart which Kotbagi supplied to explain "Long-term Memory": his chart has episodic and semantic memory systems as two sources of declarative memory ("facts"). According to his scheme episodic memory is a way of obtaining factual information—it has nothing to do with telling a story about your personal life, and creating your personal identity. The second source was from an assistant professor at the College of Business at Cardinal Stritch College in Wisconsin, Creig Kronstedt, who is apparently doing his own research on what he calls "holographic memory"—I have found no other references to this "subject" in

scientific literature, except as a technique for computational memory storage in high density crystals--which seems somewhat interesting, nevertheless it is not the best source for understanding how memory systems work.) Schacter and Tulving are undoubtedly superior references to the aforementioned.

It is crucial to keep in mind that the GinkGo! Memory game is essentially a game of memory *retrieval*. Neuroimaging techniques (PET and fMRI) used in a very large number of cognitive studies have clearly shown that semantic retrieval is localized largely to the left hemisphere, while episodic retrieval involves processes subserved by regions in the right hemisphere, illuminating basic differences in the neuroanatomy of the two memory systems. "The right frontal activation associated with episodic retrieval stands in striking contrast to semantic-memory retrieval..." (Tulving, 2002)

Probably the most valuable, and universally recognized data on the establishment of episodic and semantic memory systems as basically and essentially separate memory systems that can be reliably and predictably called upon using different types of questions and tasks, has been on work with brain damaged patients over the last fifty years. There are hundreds, perhaps thousands of examples, however I will focus on one of the most famous:

In 1953, the neurosurgeon William Beecher Scoville and the neuropathologist Brenda Milner worked with a young man known in scientific literature by his initials HM. Scoville operated on the twenty-seven year old HM to relieve his frequent epileptic seizures. He removed a constellation of structures from HM's brain, including most of the hippocampus. HM's seizures diminished, however he also lost much of his episodic memory. His semantic memory was completely undisturbed. Indeed he scored just as high or higher on a fact based intelligence test after the operation than before. But he couldn't remember important personal events, for instance he couldn't remember the death of his favorite uncle just three years earlier.

Schacter describes his work with amnesic patients which show similar results: "I asked the patient (who had sustained a head injury) about obscure facts...such as "Where was the first baseball game played?" (Hoboken) "Who holds the world's record for shaking hands?" (Theodore Roosevelt). When he did not know the correct answer, I told it to him. He was intrigued and enjoyed our game. After I left the testing room and returned twenty minutes later, he had only a dim memory that he had been tested. He did not recollect that I had mentioned any items of trivia. But when I asked him where the first game of baseball was played, he confidently answered "Hoboken", and when I enquired about the world's record for shaking hands, he felt certain that it was Theodore Roosevelt. He generally said that he had no idea how he had acquired this knowledge—the answer just "seemed reasonable"—although sometimes he proffered that he might have heard about it from his sister." HM's famous case clearly shows that

regardless of the mode of encoding, retrieval of factual semantic information calls upon the unique neuropathways of the semantic memory system.

The GinkGo! Memory Game has designed tasks that clearly solicit responses (retrieval) that call upon the unique neurological pathways of specific identifiable memory systems. For instance: when in the "Race to Remember" the players are required to list as many "rivers" as they can in one minute, it doesn't matter how or under what circumstances or conditions the information was acquired and encoded (whether they went river rafting or took a geography class), it only matters what neurological pathways in the brain are called upon to retrieve the memory and accomplish the given task. In order for the participant to use the episodic memory system to make a list of factual information in one minute, they would have to mentally go back in time and remember a specific, personal event on a river—the focus of the rememberer is then on the elements of the event which are important to his or her identity—which may or may not include the name of the river. This then would be a much too inefficient and predictably improbable way to perform the task of making a list of facts quickly. Like HM we may acquire certain information in the course of an episodic "experience" (encoding), but retrieval of the fact(s) uses the pathways of the semantic memory system.

Conversely, the telling of *the fact* that you went river rafting on a specific river does not involve episodic memory, it is simply a sterile semantic fact, unless the teller makes the recounting into a *story about an event of personal significance in his or her life*. "I went rafting on the Amazon, the Amazon is beautiful", is factual and semantic—even if the "facts" were acquired episodically. The answer to the story tasks in "Memory Lane" such as "Tell a story about one of the most memorable vistas you ever saw" cannot be answered without stimulating the episodic memory system because the storyteller must recount a personal event from their own life experience—if they *tell a story* about how they looked at a picture of a vista in a book, that would be episodic. However a simple answer "Niagara Falls is beautiful. I know because I saw it" (in a picture book once) would not be allowed as an answer because it does not involve a *personal story about an event that took place in the teller's life*. The identification of an event that took place in the past, and a sense of re-living that event (what Schacter and Tulving call "time travel") easily distinguishes the episodic memory.

Short-term memory is more cut and dry. Researchers have established that the short-term memory system (also known as working memory, which relies on unique neural pathways sometimes called the "phonological loop".) holds small amounts of information for a brief period of time and then deteriorates very rapidly, as when you are asked to look at a number sequence such as 7048692517382 for fifteen seconds and then recite it back—if you do not repeat the task many times it will not be encoded into long-term memory (semantic). Likewise, you may be able to recall the event of trying to remember the number line in fifteen seconds as an episodic story—but you will not be able to recall the

number line using the episodic memory system. With “elaborative encoding (constant repetition for instance), you might be able to remember the number via semantic memory. The tasks in the “Instant Recall” section of the GinkGo! Memory Game are designed specifically not to allow the elaborative encoding that other memory systems require in order to be engaged.

The scientific studies cited above provide solid evidence that in the course of performing the memory retrieval tasks set out in the GinkGo! Game a player will use different regions of the brain associated with different memory systems—distinguishing GinkGo! As the first Multiple Memory System Game. All other prior art only provides (intentionally or unintentionally) the stimulation of a single memory system, providing stimulation and activation of only a single set of neural pathways associated with that particular memory system. One of the reasons that the GinkGo! Game is an improvement on prior art is that it is the first game ever to have decks of cards with tasks specifically designed to stimulate different memory systems via memory retrieval. We have been playing the game for two years with the same group at a senior center in Mill Valley California. The players report not just a very enjoyable experience (it is pleasant to stimulate multiple memory systems); they also report that it is a stimulating experience, “waking up” their brains, more than other games, crossword puzzles and other cognitive activities that stimulate only one memory system.